

SECTION 712 -- FIXED BEARINGS AND EXPANSION BEARINGS, TFE TYPE

712.01 -- Description

1. The Contractor shall furnish and install fixed bearings and TFE type expansion bearings at the locations shown in the plans.
2. The fixed bearings and expansion bearings, TFE type, shall consist of the upper and lower assemblies shown in the plans. Prior to fabrication, the Contractor shall submit shop drawings to the Engineer for review.

712.02 -- Material Requirements

1. Fixed Bearings:

a. The upper assembly shall consist of a sole plate conforming to the requirements of ASTM A709/A709M grade 50W (345W) weathering steel. As an alternate, the sole plate may be grade 36 (250) steel, metallized. If the grade 36 alternate is used, all flame cut edges of the sole plate shall be ground to reduce hardness and facilitate blast cleaning. All corners of the sole plate shall be rounded to a 1/16 inch radius. All exposed plain steel surfaces shall be blast cleaned to a near white finish and zinc metallized with a minimum thickness of 8 mils (200 mm). Zinc metallizing must be performed in accordance with American Welding Society Specification AWS C2.2.

b. The lower assembly shall consist of a cotton duck reinforced elastmeric pad (CDP) conforming to the requirements of the current AASHTO *Standard Specifications for Highway Bridges* and the Department of Defense Specification MIL-C-882.

2. Expansion Bearings, TFE Type:

a. (1) The upper assembly shall consist of a sole plate conforming to the requirements of ASTM A709/A709M grade 50W (345W) weathering steel with an ASTM A240/A240M Type 304 stainless steel plate (minimum .070 inch (1.78 mm) to maximum .08 inch (2.00 mm) thickness) attached to the lower surface. As an alternate, the sole plate may be grade 36 (250) steel, metallized. If the grade 36 alternate is used, all flame cut edges of the sole plate shall be ground to reduce hardness and facilitate blast cleaning. All corners of the sole plate shall be rounded to a 1/16 inch radius. All exposed plain steel surfaces shall be blast cleaned to a near white finish and zinc metallized with a minimum thickness of 8 mils (200 mm). Zinc metallizing must be performed in accordance with American Welding Society Specification AWS C2.2.

(2) The face of the stainless steel plate in contact with the TFE sheet shall be polished or rolled as necessary to provide a number 8 mirror finish.

(3) The stainless steel plate shall be attached by welding around its full perimeter.

(4) Welding may be done with the shielded metal arc welding process using an AWS E308L-15 electrode, the gas metal arc welding process using an AWS ER308L electrode, or the gas tungsten arc welding process using an AWS ER308L filler metal.

(5) The weld shall not extend into the area of contact between the upper and lower assemblies.

b. (1) The lower assembly shall consist of a CDP pad with a 94 mil thick, low friction, virgin, unfilled, polytetrafluorethylene (TFE) sheet bonded to the upper surface. (2) Bonding of the TFE shall meet the peel test requirements (ASTM D 903) of 25 lb/in at an angle of 180 degrees.

(3) Bonding must be complete and without air gaps under the TFE sheet to seal out moisture and provide a smooth, flat, slide surface.

(4) The TFE sheet shall conform to the requirements of the AASHTO *Standard Specifications for Highway Bridges* and these *Specifications*.

c. Flatness of the bearing surfaces shall be determined by the following methods:

(1) A precision straightedge longer than the nominal dimension to be measured shall be placed in contact with and as parallel as possible to the surface to be measured.

(2) An attempt shall be made to insert a feeler gauge equal to the tolerance allowed and having an accuracy of ± 0.001 inch (0.025 mm).

(3) Bearing surfaces are "acceptable" if the feeler gauge does not pass under the straightedge.

(4) Flatness tolerances for the TFE sheet and the stainless steel plate shall be $0.0005 \times$ "Nominal Dimension."

(5) The "Nominal Dimension" shall be the actual dimension, in inches, under the straightedge where the straightedge is not parallel to any plan dimension of the sheet or plate being measured.

3. a. All components for the bearing assemblies shall be fabricated, assembled, and certified by the manufacturer for the complete assembly. The assemblies shall be suitably packaged to prevent damage during shipment and storage.

b. The certification shall include all required test reports indicating that the static and kinetic coefficient of friction between the sliding surfaces does not exceed 0.08 at the pressure of 500 psi and shall state that all materials used in the fabrication of the bearing assemblies comply with the requirements of this *Specification*.

c. Testing shall be in accordance with the AASHTO *Standard Specifications for Highway Bridges*. The Engineer shall be allowed to witness all testing and approve the testing agency or other parties involved in the testing operation.

4. Anchor bolts, nuts, and washers shall conform to ASTM A 307 and shall be galvanized in accordance with ASTM A 153.

5. The manufacturer of the fixed or expansion bearings shall provide to the Engineer all appropriate certified mill test reports for all materials used in the manufacturing process.

6. Shop plans for bridge bearings must include the following notes when applicable.

a. All manufacturing, testing and certification of these materials shall be in accordance with the NDR Standard Specifications, Section 712, "Fixed Bearings and Expansion Bearings, TFE Type".

b. Certification shall include all required test reports indicating that the static and kinetic coefficient of friction between the sliding surfaces does not exceed 0.08 at the pressure of 500 psi (3.5 MPa) and shall state that all materials used in the fabrication of the bearing assemblies comply with the requirements of NDR Specifications.

c. Testing shall be in accordance with the AASHTO *Standard Specifications for Highway Bridges*.

d. The assemblies shall be suitably packaged to prevent damage during shipment and storage.

e. The stainless steel plate shall be attached to the sole plate by welding around its full perimeter. The weld shall not extend into the area of contact between the upper and lower assemblies.

f. Bonding of the TFE sheet must be complete, without air gaps under the TFE sheet, to seal out moisture and provide a smooth, flat, slide surface.

g. The flatness tolerance for the TFE sheet and the stainless steel plate shall be $0.0005 \times \text{"Nominal Dimension"}$.

712.03 -- Construction Methods

The Contractor shall provide and install the bearing assemblies as prescribed in the plans.

712.04 -- Method of Measurement

The fixed bearings and expansion bearings are assembled units that are measured by the each.

712.05 -- Basis of Payment

- | 1. Pay Item | Pay Unit |
|-----------------------------|-----------------|
| Fixed Bearing | Each (ea) |
| Expansion Bearing, TFE Type | Each (ea) |
2. Payment is full compensation for all work prescribed in this Section.